CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

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JAS-ANZ BSCIC ISO 9001 REGISTERED

Job No.: CTCE/BBMP/W.No.11/KRIDL/WMM/Gradation/2014-15

23.07.2014

GRADATION FOR WMM
MORTH TABLE-400-11

Client : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Technical Manager,** KRIDL, Bangalore.

Name of Work : Improvements to Roads and Asphalting to Teachers Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : AEE/VSD/PR/175/8/2014-15 Dated: 19.07.2014

Date of Testing : 23.07.2014

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **26065**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	850	850	3.3	96.7	95-100
22.4	5415	6265	24.0	76.0	60-80
11.2	5650	11915	45.7	54.3	40-60
4.75	4215	16130	61.9	38.1	25-40
2.36	4050	20180	77.4	22.6	15-30
0.600	2585	22765	87.3	12.7	8-22
0.075	2890	25655	98.4	1.6	0-8

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Job No.: CTCE/BBMP/W.No.11/KRIDL/WMM/AIV/2014-15 23.07.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	Improvements to Roads and Asphalting to Teachers Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/VSD/PR/175/8/2014-15 Dated: 19.07.2014
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	23.07.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	392	393	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	89	90	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	303	303	
4	Aggregate Impact value = percent fines	22.70	22.90	
	100* (W_2/W_1)%			22.80

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರ
ವಿದ್ಯಾರಣ್ಯಪುರ ಉಪ ವಿಭಾಗ
ಯಲಹಂಕ ವಲಯ
ಬೃ ಬೆಂ. ಮ. ಪಾ., ಬೆಂಗಳೂರು-97

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Job No.: CTCE/BBMP/W.No.11/KRIDL/WMM/S-T/2014-15 23.07.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager**, KRIDL, Bangalore.
Name of Work	Improvements to Roads and Asphalting to Teachers Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP,
Reference	AEE/VSD/PR/175/8/2014-15 Dated: 19.07.2014
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	23.07.2014

Result : Flakiness Index = **12.39%**

Elongation Index = **13.90%**

Result : Combined Flakiness & Elongation index **26.29%**

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.11/KRIDL/SDBC/AIV/2014-15 26.07.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	Improvements to Roads and Asphalting to Teachers Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/VSD/PR/175/8/2014-15 Dated: 19.07.2014
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
28.07.2014	26.07.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	388	389	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	88	89	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	22.68	22.88	22.78

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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ಯಲಹಂಕ ವಲಯ,
ಬ. ಬೆಂ. ಮ ಪಾ . ಬೆಂಗಳೂರು-೯೧

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Job No.: CTCE/BBMP/W.No.11/KRIDL/SDBC/Shape_T/2014-15 : 26.07.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager,** KRIDL, Bangalore.
Name of Work	: Improvements to Roads and Asphalting to Teachers Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	: AEE/VSD/PR/175/8/2014-15 Dated: 19.07.2014
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 26.07.2014

Result : Flakiness Index = **12.35%**

Elongation Index = **13.10%**

Result : Combined Flakiness & Elongation index **25.45%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.11/KRIDL/SDBC/Stripping/2014-15 . 26.07.2014

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the work	Improvements to Roads and Asphalting to Teachers Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP,
Reference	AEE/VSD/PR/175/8/2014-15 Dated: 19.07.2014
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	26.07.2014

Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.1	3.20	96.80
2	3.2		
3	3.3		

Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.11/KRIDL/SDBC/Sp_Wa/2014-15 26.07.2014

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	Improvements to Roads and Asphalting to Teachers Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/VSD/PR/175/8/2014-15 Dated: 19.07.2014
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	26.07.2014

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2019	2020	2022	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1264	1265	1267	
4	Weight of saturated surface dry aggregate in air	W_3 g	2015	2016	2017	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	751	751	750	
6	Weight of oven dried aggregate	W_4 g	2005	2006	2000	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.670	2.671	2.667	2.669
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.706	2.707	2.729	2.714
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.50%	0.50%	0.85%	0.62%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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Job No.: CTCE/BBMP/W.No.11/KRIDL/WMM/Gradation/2014-15 23.07.2014

GRADATION FOR WMM
MORTH TABLE-400-11

Client : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Technical Manager,** KRIDL, Bangalore.

Name of Work : Improvements to Roads and Asphalting to Teachers Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : AEE/VSD/PR/175/8/2014-15 Dated: 19.07.2014

Date of Testing : 23.07.2014

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): **25900**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	990	990	3.8	96.2	95-100
22.4	5395	6385	24.7	75.3	60-80
11.2	5525	11910	46.0	54.0	40-60
4.75	4200	16110	62.2	37.8	25-40
2.36	4020	20130	77.7	22.3	15-30
0.600	2620	22750	87.8	12.2	8-22
0.075	2865	25615	98.9	1.1	0-8

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Job No.: CTCE/BBMP/W.No.11/KRIDL/SDBC/Bitumen/2014-15 26.07.2014

BITUMEN CONTENT AND GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

AASHTO T 164 & AASHTO T 30

CLIENT	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP,
AGENCY	**Technical Manager,** KRIDL, Bangalore.
NAME OF THE WORK	Improvements to Roads and Asphalting to Teachers Layout Main Roads in Ward No.11, (Kuvempunagara) Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	AEE/VSD/PR/175/8/2014-15 Dated: 19.07.2014
SAMPLE I/D	Roads and Asphalting to Teachers Layout Main Roads in Ward No.11,No.11
DATE OF TESTING	26.07.2014

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475	474
3. Weight of Asphalt and Mineral matter Extracted,	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25	26.00
7. Bitumen content in %	5.00	5.20
8. Average	**5.10**	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Trail 1				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	36.25	7.63	7.63	92.37	90-100
4.75	261.3	55.01	62.64	37.36	35-51
2.36	58.12	12.24	74.88	25.12	24-39
1.18	41.25	8.68	83.56	16.44	15-30
0.3	28.32	5.96	89.52	10.48	9-19
0.075	27.86	5.87	95.39	4.61	3-8

SIEVE SIZE	Trail 2				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	25.23	5.05	5.05	94.95	90-100
4.75	241.6	48.32	53.37	46.63	35-51
2.36	93.55	18.71	72.08	27.92	24-39
1.18	51.48	10.30	82.37	17.63	15-30
0.3	31.98	6.40	88.77	11.23	9-19
0.075	21.63	4.33	93.09	6.91	3-8

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